

Teaching and learning the tones of Mandarin Chinese

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Abstract: This article explores issues around the learning of the four tones in Mandarin Chinese, particularly by native speakers of English. It introduces the reader to the nature of the tones and outlines current teaching practice in common use. It then explores difficulties encountered at the early learning stages. It is shown that native speakers of non-tonal languages need to develop and exercise new areas of the brain through repeated practising of tones, and that musical ability makes it easier to learn the tones.

Keywords: Mandarin Chinese; tones; pinyin

Introduction

New students of Mandarin Chinese often find tones confusing and difficult to learn, leading to frustration, disappointment and neglect. This article focuses on the very early stages of learning the tones of Mandarin Chinese, that is, on how students become familiar with identifying the tones when they hear them, and how they learn to vocalise the tones in individual words or syllables.

What are tones?

Tones refer to the pitch made when a word is spoken. For example, in English a word, “dog” for example, could be said with the voice at a constant high pitch, or with the pitch starting low and ending high. Whichever way “dog” is said in English it still means the same thing, i.e. an animal that barks. But in Mandarin the same is not true: If a word, “ma” for example, is said with the voice at a constant high pitch it means “mother”, but if “ma” is said with the pitch starting low and ending high, then it means “horse”.

There are four principal tones in Mandarin.

1. The first tone is high and level.
2. The second tone is rising.
3. The third tone is falling and rising.
4. The fourth tone is falling and stressing.

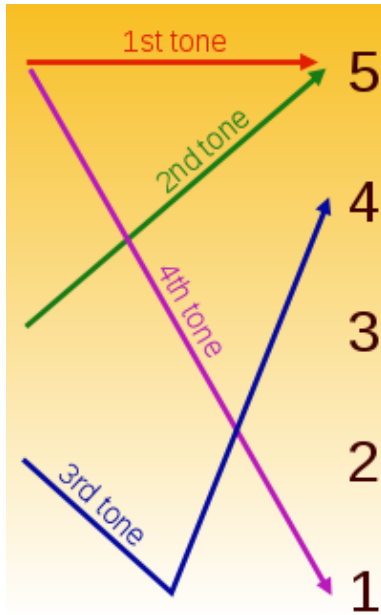


Figure 1: The four tones of Mandarin Chinese

Source: http://en.wikipedia.org/wiki/Image:Pinyin_Tone_Chart.svg

Every syllable in Mandarin has a meaning. Words in Mandarin are either single syllable, or are made up by putting together two single-syllable words. Each syllable can have one of the four tones, and the tone or tones define the meaning of the syllable/word.

Why are tones important?

In Mandarin Chinese tones are used to distinguish words from each other in the same way that consonant and vowel combinations are in English. Correct tonal pronunciation is therefore essential as is the ability to distinguish tones when listening. There are a vast number of characters in Mandarin that have the same consonant and vowel sounds, but different tones.

A study by McGuiness (1997) emphasises the importance of tones in Chinese and says that most learners of Chinese as a second language find the new concept of using tone to change the meaning of a word “so far removed from their native English language experience as to render the mastery of tones problematic, neglected, or both”.

Who needs to learn tones?

Everyone who wants to learn Mandarin needs to learn to hear the difference between tones and needs to learn to use tones when speaking. Indeed, it is essential that students learn to use tones at the very earliest stages. For native speakers of non-tonal languages this can make initial progress of learning Mandarin Chinese appear slow compared to European languages. Students familiar with other tonal languages would probably have the necessary

skills already, but they would still have to learn the specific tones of Mandarin words. For the vast majority of learners in the UK, however, learning to hear and speak tones is a completely new skill.

Teaching Tones

Tones are usually introduced in the first lesson of Mandarin. Students are told that the tone changes the meaning of the word. Teachers often use the Mandarin word “ma” as an example, saying it in the different tones and explaining that it means different things. The teacher might choose to write the Chinese character for each “ma” on the board and point to the character when speaking the word. But this is of little use to students because they cannot remember complicated pictograms at this stage, so students need to be taught a way to write down the sound of Mandarin words using a system that shows tone. The system used is Pinyin, a standardised system for spelling Mandarin words with letters of the English alphabet, along with marks over vowels to indicate tones, as in the examples below:

Tone	Description	Tone depicted in Pinyin	Pinyin example	Meaning
1 st	high and level	ˉ	ma	mother
2 nd	rising	ˊ	má	hemp
3 rd	falling and rising	ˇ	mǎ	horse
4 th	falling and stressing	ˋ	mà	admonish

Students are usually introduced to Pinyin at the same time as they are introduced to tones. As lessons progress, a lot of time is spent on listen-and-repeat exercises, to practise tones. Students write words using Pinyin, because Pinyin allows the student to ‘see’ the tone. In this way, students learn to listen for tone, and to pronounce words with the correct tone.

When introducing tones teachers often present groups of words that have the same sounds except for the tone and ask the students to listen and try to make the same sound. It can take up to 16 hours or so for students to manage speaking single words in the appropriate tone.

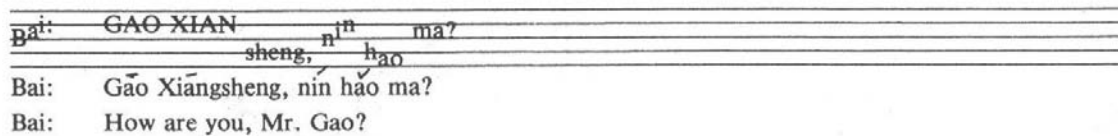
Is Pinyin a good system?

Researchers at the University of Pittsburgh (Ying Liu et al, 2006) split a class of first-year students into three groups. The three groups used the following tools to learn tones:

- 1) visual pitch contours of the tones, together with Pinyin (contour + pinyin, e.g. .\ . mà)
- 2) numbers that represent the tones, together with Pinyin (digit + pinyin, e.g. 4th, mà)
- 3) visual pitch contours without Pinyin (visual contour only, e.g. .\ .)

The study found that the contour + pinyin and digit + pinyin conditions produced significantly faster learning rate. Furthermore, improvement from a pre-test to post-test was largest for contour + pinyin condition. In other words, Pinyin helped the students to learn tones, and because they need some system that allows them to write down the tone of a word or syllable. The study also points out that there are two stages in learning tones - one that learns a tone as a general feature to speak with any syllable, and one that learns individual syllable plus tone combinations so that meaning can be understood.

Lin (1985) proposed that Pinyin should be written on horizontal lines similar to music as in the example below, however, it failed to become popular and is not known to be in common use anywhere.



Using visual signs to show the tone.

Many teachers use hand gestures and other body movements to help teach tones.

The method I use is:

1st tone	flat hand moved across the body at shoulder height
2nd tone	raise your eyebrow every time you say the 2nd tone.
3rd tone	drop your chin on your neck and raise your chin when you say the 3rd tone.
4th tone	stamp your feet when you say the 4th tone.

Students are encouraged to make the gestures themselves when they speak, and it is generally accepted that when students say the tones with the actions at the same time, they can master the tones faster than if they do not use the actions. Two potential pitfalls exist with this method: older students may feel silly making gestures and there is a possibility that some students may continue to make the gestures even though they have mastered the language and can hold complex conversations. Hand signals have the advantage that a speaking student can be corrected without interruption.

Colours can also be used to show tones. This has the advantage that the colour system can be extended to flashcards with characters at later stages of learning.

Practise

All existing research suggests that most teachers make extensive use of listen-and-repeat to teach tones.

The amount of practise needed might be a problem in class due to lack of time, but many on-line programs exist that play a random Chinese word through PC speakers. The listener has to identify the tone by clicking on a graphic. The PC then tells the listener whether they identified the tone correctly or not.

Speakgoodchinese (<http://speakgoodchinese.org/>) is a free program for a PC. The program presents one or two Mandarin words and a graph-like picture showing the tones. The student clicks and the PC plays the sound of the word or words. The student then tries to record the same words with the same tonal sounds. The students can play back the sound they recorded and at the same time see a visual graph of the sound they made, which can help them to understand what they are doing wrong. Many students enjoy this method of learning.

Why is learning to use tones so challenging?

Brain Activity

Knowing about activity within the brain may explain why Mandarin is not easy to learn in the early stages, and why practise is so important. UCI researchers (Zeng, 2006) studied brain scans of subjects as they listened to spoken Mandarin. They found that the brain processes the tone of the words in the right hemisphere slightly before the left side of the brain processes the semantics, or meaning, of the information. In the English language, Zeng says,

changes in pitch dictate the difference between a spoken statement and question, or in mood, but the meaning of the words does not change. This is different in Mandarin, in which changes in pitch affect the meaning of words.

This indicates how confused a native speaker's brain must be at the early stages of learning Mandarin because if it hears a tone in a word it makes a decision about the intention of the word (for example, questioning, ordering, scolding, etc.) whereas it should be using the tone to get the actual meaning of the word.

Others studies (e.g. Wang et al, 2003) have shown that in the early stages of learning the Mandarin language some changes are made in the brain:

Learning a tone-based second language involves both expansion of pre-existing language-related areas and recruitment of additional cortical regions specialized for functions similar to the new language functions.

This suggests that the brain of a native speaker of a non-tonal language is just not capable of processing tone properly, and some areas of the brain have to be trained to use tones in the correct way.

Judging by the above two studies, it seems that students of non-tonal languages may need to practise tones extensively just to get their brains used to linking tone to the meaning of words (rather than the intention of a sentence), and to make new areas of their brains grow.

How do students feel about learning tones?

Many students say that they have difficulty remembering which tone goes with which word. This shows that they are still thinking of tones as not really being part of a word. For native speakers of Mandarin, tones are always part of a word, so it is not possible to learn a word and forget which tones it is. Once students have studied for a few years they do not have such a big problem trying to remember which tone goes with which word.

Some students feel silly making strange sounds when speaking Mandarin, others do not like to make hand gestures when speaking. If the class has good atmosphere and is fun, these students might feel less self-conscious.

Many consider the third tone to be the most difficult to master, with students getting confused very easily between the second and third tone. However, there is general agreement that all the tones can and do cause confusion. If only one tone was causing problems, it could be concentrated on until solved, but it is the whole skill of using tones in general that causes problems at the very early stages of learning.

Lin (1985) observed that the third tone is only low-dipping-rising when is used in isolation, or when it is used in contrast with another syllable, or when used for emphasis. But in most cases, says Lin, the third tone simply dips. Also, Lin said that when a native speaker of Mandarin speaks slowly they use low-dipping-rising, but if they speak at normal pace the third tone just dips. Lin said that students should be told that the third tone is low-dipping, and that there are special cases when it is low-dipping-rising. He taught classes in this way for three years then tested their ability to use the third tone, and found some improvements over groups that were taught that tone three is low-dipping-rising. Lin's findings are interesting, but they have not been adopted by the teaching community and the third tone continues to be taught as low-dipping-rising.

Teachers are aware that main difficulty is that Anglophone students use the stress and intonation of English when they make Mandarin sentences. This is a very big problem, but as this article focuses mainly on hearing and speaking tones in single syllables/words it will not be discussed.

Musical background

Native speakers of English may have to increase their vocal range to speak Mandarin. Chen (1974) compared the pitch range between English and Chinese speakers. The results showed that Mandarin needs a pitch range 1.5 times wider than English, and that native English speakers do not have this range naturally. The author claimed that native speakers of a non-tonal language need to widen their pitch range to successfully acquire a tonal language. Wong and Perrachione (2006) studied a group learning Mandarin tones, and found that “large individual differences were observed. Learning success was found to be associated with the learner’s ability to perceive pitch patterns in a non-lexical context and their previous musical experience”. Experienced teachers have also reported that students with musical training learn Mandarin faster.

Conclusions

Learning the tones of Mandarin Chinese usually presents challenges to new students. Native speakers of English need to use different parts of their brains when using the tones of Mandarin than when using English; indeed sometimes new areas of the brain have to be brought into use for the first time (Wang et al, 2003). Students should be made aware of these facts - this might make them feel less frustrated and help them understand why it is essential to practise tones regularly.

Practice is the key to developing the areas of the brain that are needed to process tones. The listen-and-repeat drills that have traditionally been used extensively for teaching Mandarin are ideal for this, and should not be regarded as too old-fashioned or boring to be used in the classroom. Extra practise of the tones should be encouraged, for example using ICT tools such as Speakgoodchinese.

Pinyin, the method used to transcribe Mandarin words including the tone, has been shown to be a good system (Ying Liu et al, 2006) and its use is recommended in every situation. The fact that it is in widespread use in textbooks and is approved by the Chinese Government means that students can have a consistent standard throughout their learning lives.

The third tone may give more difficulties for speakers of English than other tones. It is not the only tone that causes problems so teachers should concentrate on teaching students to use tones in general, with slightly more emphasis on the third tone. One study (Lin, 1985) has shown that it might be better to teach the third tone as low-dipping rather than low-

dipping-rising, but this would be different to all existing text books and common practice and would require a lot more research before being introduced. If taught in this way, students might be confused by lack of consistency. All students learn at different rates. Learners with a musical background are likely to learn faster (Wong and Perrachione, 2006). Some students feel embarrassed at having to “sing” the tones or make body movements - these students may also take longer to become competent at using tones. Teachers should make an effort to encourage a carefree and fun atmosphere in class so that student can overcome their inhibitions about speaking “in a funny voice”.

Being able to hear or speak tones in individual syllables (words) leads students to the next stage i.e. learning to control tones within sentences. In English tone can be used to change the meaning or intention of a sentence; for example, the end word of a question is often said with a rising tone. If a student needs to make a question in Chinese that ends with a word that has a falling tone, they need to overcome their natural desire to use a rising tone at the end of the question. This skill builds upon the foundations of being able to use tones within individual words or syllables.

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